SOIL MOISTURE SENSOR

TECHNOLOGY READINESS LEVEL: 4

KEY ELEMENTS HAVE BEEN DEMONSTRATED IN A LABORATORY ENVIRONMENT.

US PATENT # 6,663,012

TECHNOLOGY SUMMARY

In the agriculture industry, it is critical to know the water content in the soil in order to maintain the viability and profitability of an agriculture business. With the high cost of water, it is essential to limit the amount of water used to only what is necessary for the health of the plant. Current technologies provide soil moisture information that is limited to areas near the surface of the soil. As the demand on water resources increases, there is a need for technology that provides subsurface measurements of water held in lower layers of soil. Sandia National Laboratories has invented a method and system for determining the soil moisture at depths of more than a few feet.

As cultivated land is irrigated or receives precipitation, water accumulates over time in the soil. This invention measures the amount of accumulated moisture in the soil to determine when and how much irrigation is needed. The amount of water needed for the cultivated field is determined by monitoring the decrease in secondary cosmic radiation intensity as the quantity of water in the soil increases. The sensor is placed five feet below the surface and a reference sensor is mounted above ground, which measures the total incoming cosmic radiation. The sensors measure moisture over a relatively wide area, measuring moisture from about a 10-foot-wide circle at the surface.

POTENTIAL APPLICATIONS

- Agriculture Industry
- Wine Industry
- Water Efficiency/ Conservation

TECHNOLOGICAL BENEFITS

- Enhances irrigation efficiency
- Measurement apparatus is practical, inexpensive, easy to install, and requires little maintenance
- Provides available data in “real time”
- Measures relatively wide area of soil

TECHNOLOGY INQUIRY?

For more information or licensing opportunities contact us at

ip@sandia.gov

Refer to SD # 8351

or visit

https://ip.sandia.gov

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